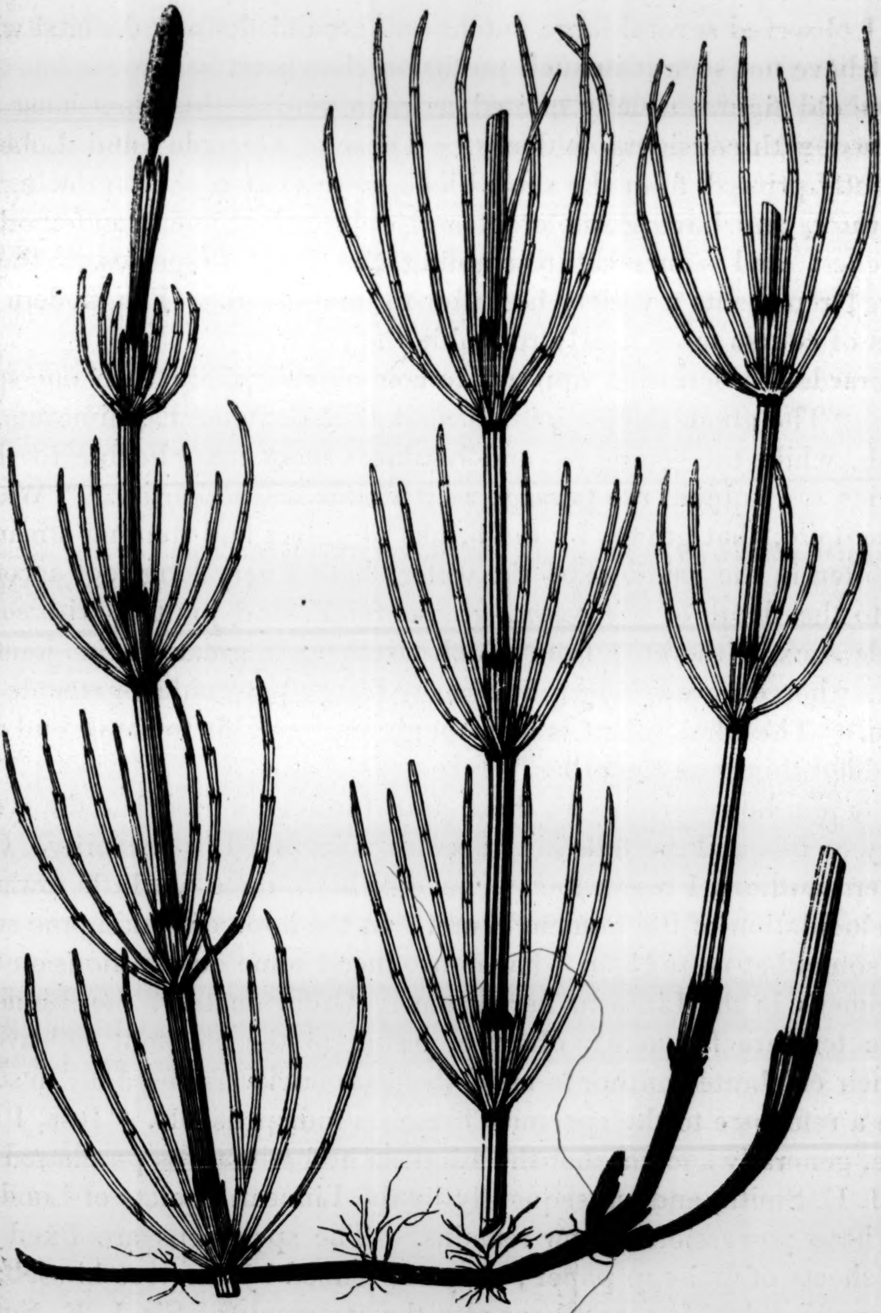
THE PHYTOLOGIST.

ART. CXXVIII.—*A History of the British Equiseta.* By EDWARD NEWMAN. Continued from p. 340.



MARSH HORSE-TAIL.
EQUISETUM PALUSTRE of Authors.

THIS species appears to be generally distributed: it occurs in all the county lists of ferns which I have received, and is rarely mentioned either as local or uncommon. In Ireland I found it particularly abundant, especially in the north: in the vicinity of the Giant's Causeway I observed several large patches of ground densely covered with it. I have not seen it in such profusion elsewhere.

The old figures usually quoted as representing this plant must be received with considerable doubt. Those of Gerarde* and Lobel,† evidently printed from the same block, represent a plant growing in the water, and having one erect and unbranched stem, and another branched, and somewhat resembling the present species. Ray's figure‡ represents a variety hereafter to be noticed. The modern figures of course more nearly resemble the plant.

Gerarde's description appears to comprehend more than one species: "The great thicke jointed stalk" describing Eq. limosum of Smith, while the roughness and hardness seem inapplicable to that species. I subjoin the passage as it stands in the herbal. "Water Horse-taile, that growes by the brinks of riuers and running streams, and often in the middest of the water, hath a very long root according to the depth of the water, grosse thicke and jointed, with some threds anexed thereto: from which riseth vp a great thicke jointed stalk, whereon grow long rough rushy leaues pyramide or steeple fashion. The whole plant is also rough hard and fit to shave and rub woodden things as the other."

It is not however only in these ante-Linnean works that the synonymy of this and the following species is involved in obscurity. Our modern authors, I regret to say, have hitherto done but little towards the elucidation of the nomenclature. In the hope of making the subject somewhat more clear, I have introduced some observations on the specimens in the Linnean herbarium. Unfortunately, the Linnean characters are frequently obscure, owing to the constant endeavour of their celebrated author to make them as concise as possible: in such case a reference to the specimen becomes indispensable. It is, I believe, generally known, that the Linnean herbarium was purchased by Sir J. E. Smith, and subsequently by the Linnean Society of London, in whose possession it now remains. The specimens are fixed on half sheets of foolscap paper; they are named by Linneus himself, in his own handwriting, and have also the comments of Sir J. E. Smith wherever it appeared to him necessary or useful to add an explanatory note. A few labels with MS. notes are pasted in, but I am not certain of their author. The Equiseta are comprised in a fasciculus of nine folios: the fasciculus is endorsed thus,—"1169, Equisetum," in the handwriting of Linneus.

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* Ger. Em. 1113. † Lobel, 795. ‡ Synopsis, tab. v. fig. 3.

In the same apartment are preserved the author's own copies of the first and second editions of the 'Species Plantarum.' In the first all the species possessed by the author are distinguished by a particular mark; and the second is enriched with his own unpublished notes. I will now endeavour to combine the information obtained from these several sources, only quoting the *published* characters when requisite, and adding remarks of my own on every specimen.

FOLIO 1.

Linneus.—1. sylvaticum.

E. N.—A single young specimen of Eq. sylvaticum of Smith, with a very perfect catkin.

FOLIO 2, pinned by Linneus to the preceding.

E. N.—Two mature specimens of Eq. sylvaticum of Smith, without fructification.

FOLIO 3.

Linneus.—2. arvense.

Anonymous.—1061. Equisetum setis ramosis. Equisetum verticillis ad folia numerosis. Hall. Stirp. Helv. 144. Equisetum sylvaticum, tab. p. 253.

E. N.—Two specimens: right hand, a fertile specimen of Eq. arvense of Smith, with perfect catkin; left hand a mature specimen of Eq. sylvaticum of Smith, without fructification.

FOLIO 4, pinned by Linneus to the preceding.

Linneus.—Hispania, 713. Loeft.

E. N.—Three specimens without fructification, all of them apparently starved or distorted: they probably belong to the Eq. arvense of Smith. The Linnean MS. is on the back of the folio.

FOLIO 5.

Linneus.—3. palustre.

Smith.—?

Anonymous.—1060. Equisetum setis simplicibus. Equisetum minus terrestre. I. B. M. p. 730.

E. N.—Two specimens without fructification, and in a very unsatisfactory state of growth: right hand appears to me to be Eq. arvense of Smith; left hand is perhaps Eq. palustre of Smith.

Folio 6.

Linneus.—4. fluviatile.

Linneus [Sp. Plant.*]—Fluviatile 4. Equisetum caule striato frondibus subsimplicibus; [here follow the synonymes]. *Habitat in* Europa *ad ripas lacuum fluviorum.* ♃.

———. [MS. addition over the word *striato*], an striato?

———. [MS. addition on the opposite page, the copy being interleaved, and in allusion to a reference to Haller]. Hoc caules proliferos a sterilibus definiter profert. Hall. [The passage in Haller is this —"Caulis floriger videtur a folioso remotus."†]

———. [MS. addition below the preceding]. Forte mera varietas prioris [palustre] ex solo aquæ profundioris.

Smith.—limosum? Certè.

E. N.—Four specimens, all with catkins, and identical with Eq. limosum of Smith. As there is no representative of Eq. limosum of Linneus, and as the marked copy of the work indicates that he did not possess it, I subjoin the character.

Linneus.—[Sp. Plant.]. Limosum, 5. Equisetum caule subnudo lævi, [here follow the synonymes]. *Habitat in* Europæ *paludibus, turfosis, profundis.* ♃.

———. [MS. addition on the opposite page]. Hallerus hanc facit varietatem E. palustris.

E. N.—It is clear that Linneus trusts to Ray as the authority for this as a distinct species, since he quotes his figure,‡ which evidently represents the unbranched form of Eq. limosum of Smith. Hence it seems that Eq. fluviatile of Linneus is the branched, and Eq. limosum the unbranched form of Eq. limosum of Smith; and that Eq. fluviatile of Smith has no representative either in the herbarium or the works of Linneus. With respect to the observation of Linneus quoted above, that Haller makes this species a variety of Equisetum palustre, I think the criticism is an unjust one. Haller quotes Ray's figure 3, and, as it seems to me, correctly, as a variety of Eq. palustre; while Linneus quotes Ray's figure 2, which is evidently the Eq. limosum of Smith. A positive proof that the fluviatile of Linneus was not the fluviatile of Smith, exists in the fact that he attempted to account for its increased size and altered appearance by its growing from the bottom of deep water: this is the case with Smith's limosum, but never with his fluviatile, which, on the contrary, affects loose gravelly and sandy places unconnected with water.

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* Sp. Plantarum, 1517.

† Haller, Helv. 144.

‡ Syn. t. 5, fig. 2, *a*, *b*.

FOLIO 7.

Linneus.—Œdific.: hyemale.

———. [Sp. Plant. MS. addition on the opposite page]. Equisetum caule simplici aspero vaginis non laciniatis. Hall. Helv. 143.—Caulis viridis scaber, radiis [?] vaginæ pallidæ basi marginisque denticulis obsoletis atris gibbis.

E. N.—A single specimen of Eq. hyemale of Smith. The word or abbreviation "Œdific." implying its uses, is written apart from the name.

FOLIO 8.

Linneus.—Tourelle.

Smith.—Asperrimum, Dick., variegatum, Jacq. H. B.—J. E. S.

Anonymous.—Equisetum basiliense, No. 1678, haller. An species distincta apud cl. linn.? In horto cultum.

E. N.—A single specimen of Eq. variegatum of Smith. Linneus answers the question as to its being a distinct species, by giving basiliense as a synonyme of hyemale (Phytol. 338). The word "Tourelle" written by Linneus is probably a habitat.

FOLIO 9, pinned by Linneus to the preceding.

Linneus.—Suec.

E. N.—A single specimen of Equisetum variegatum of Smith, much more slender than the preceding: the Linnean MS. evidently implies the habitat, Sweden.

I think the above notes will be sufficient to show that as regards several species of Equisetum, more especially the present, generally known as palustre, the Linnean herbarium is not a sure guide. There is, however, much collateral evidence that Linneus was not only acquainted with the Equisetum palustre of modern authors, but that he referred to that species when he named the plant in question; for he expressly states that his fluviatile (Smith's limosum) may be a variety of palustre growing in deeper water. Now as he was so well acquainted with fluviatile (Smith's limosum), and possessed such good specimens, his judgment cannot be supposed so much in fault as to have referred it to arvense. The error must have arisen from a want of care in the selection of specimens for his herbarium. Moreover, the name palustre is now too universally employed to admit of its being changed, without a better reason than a discrepancy which may have originated in carelessness. The same is not the case with fluviatile: I am decidedly of opinion that the name in this instance must be changed; and I make the proposition previously to publishing the species, in order that I may be favoured with the opinions of those botanists who think otherwise. I propose restoring the Linnean name to the limosum of Smith, and sinking the name limosum to the rank of a variety; thus:—

Equisetum fluviatile, Linn. = *Equisetum limosum*, Smith.
" " β. *limosum*, with the stem quite simple, = *Equisetum limosum* Linn.

The species hitherto called fluviatile is already so well provided with names that it is difficult to determine which to select. It seems to be the Equisetum majus of Gerarde* and Ray,† the Eq. Telmateia of Ehrart ‡ and Flora Danica,§ and the Eq. eburneum of Roth.||

In a plant of which the synonymy is so imperfectly known as the marsh horse-tail, it is by no means an easy task to trace the record of medical and other properties. Haller seems to have collected together a number of wise saws from a variety of sources, and gives them under his Equisetum No. 1677: but not only do I doubt whether the whole of them were intended for any one species, but I also doubt whether his No. 1677 is the species now under consideration. The point is not worth a very rigid scrutiny. He makes out his No. 1677 to be hurtful to oxen and cows, giving them diarrhœa and making their teeth loose, but at the same time to be harmless to horses and sheep. He also speaks of the great difficulty of extirpating it from a field where it is once naturalized: of its uses as a medicine he cannot speak with certainty.¶

The roots are slender and frequently divided; they appear to spring from the joints of the rhizoma, and are generally covered with minute fibrillæ. The rhizoma is creeping, and extends to a great length; it is of nearly the same diameter as the stem, very black and shining, and smooth to the touch: at the joints it is solid, but the internodes are more or less hollow.

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* Ger. Em. 1113. f. † Ray, Syn. 130. ‡ Ehr. Beitr. ii. 159. Crypt. 31.
§ Flora Danica, tab. 1469. || Roth, Cat. i. 129.

¶ Haller, 3. 2. 1677. Hoc equisetum minus quam 1676 tamen et ipsum pecori nocet et dentium facit in bobus et vaccis vacillationem tum diarrhœam. Cum seductus pulchritudine Trifolii Equiseto 1676 inquinati, famulus, qui boum meorum curam gerebat, semel aut iterum vaccam nuper vitulam enixam hac pestilente herba aluisset, ex diarrhœa immedicabili eadem periit. Quare magnis pecuniis nostri arcanum redimerent, quo prata infaustissima herbarum liberarent. Mihi neque aratrum, neque fimus, neque alia cura profuit. Equis non nocet, neque ovibus et rangiferis. Porci nostrates recusant, cum in Suecia non detrectant. Radicibus tamen glandium simile aliquid sæpe adhæret, quod porcos credas requirere.

Vires medicas vix satis certas autumo. Aquosa planta est, parum acris: ei adstringentes vires tribuerunt in diarrhœa, in hæmoptoe efficaces, &c. &c.

The engraving at the head of this article represents a stem of marsh horse-tail of the normal size and proportions: in order to exhibit the whole at one view, the stem has been divided into three portions.—The stem is perfectly erect, about fifteen inches high, deeply furrowed and finely granulated: the furrows are eight in number, the granulations of the ridges between them feel rough to the edge of the nail if drawn along them. The stem is divided into eleven compartments by means of transverse septa; the internodes are an inch and a quarter or an inch and a half in length: the sheaths occur at the septa, and correspond in number; they considerably exceed the stem in circumference, and in consequence are loose: the ridges of the stem enter the sheaths and terminate in the teeth, which are eight in number, acute, wedge-shaped, tipped with black, and furnished with nearly transparent membranous edges. There are nine whorls of branches: these rise from the furrows of the stem, close to the base of the sheaths; they never exceed the furrows in number, and are frequently fewer; at the base of each is a short black sheath, and these form a series of black rings round the stem: they are divided into six or eight joints, of which the basal and apical are the shortest: they have five furrows, and the sheaths occurring at the joints are five-toothed; the teeth are tipped with brown: the branches vary in length in the same whorl, and still more so in different whorls.

The catkin is long and rather narrow; when mature it stands on a distinct stalk of its own length: it is terminal, and after discharging its seeds it appears to perish, the stem and branches continuing to retain their vigour. There is no apiculus, the extreme summit being composed of a scale similar to the rest: at first the scales are crowded together, forming a black mass, they afterwards separate, the peduncle supporting each becomes visible, and the catkin, increasing in length, assumes a brown colour. The catkin appears in May and June.

This species, like the preceding, is subject to extraordinary variations, the most striking of which I shall describe.

Edward Newman.

(To be continued).

ART. CXXIX.—*Notes of a Solitary Ramble to Loch-na-gar &c., with Remarks on several species of Plants collected in the course of it, on the* 14*th of July*, 1842. By Mr. J. B. BRICHAN.

WEARIED with a walk of at least twenty miles, I arrived at Castleton of Braemar about 9 o'clock on the evening of Wednesday the 13th of July. For several miles, further down the Dee, I had found the pretty alpine plant, Alchemilla alpina, in situations where neither river nor torrent could have carried it from its native bed. In these situations, therefore, it is strictly wild, but at what height above the sea I am unable to say. This plant is found also within a few miles of Aberdeen, where it has undoubtedly been washed down and planted by the river.

At half-past 7 the next morning I left Castleton, and proceeded in the direction of Loch Callader, which lies to the south-west of the "dark Loch-na-gar," and the vicinity of which has been visited and explored by botanists times and ways innumerable. In my walk to this localitiy, to which one half of the road runs through Glen Callader, and through ground which is altogether *highland*, I met with no plants strictly alpine, except Alchemilla alpina, Oxyria reniformis, Saxifraga aizoides and S. stellaris. The sides of the road and ground adjacent were covered with hosts of plants, which, as they are, generally speaking, found in all situations and at all elevations, I do not consider in any sense *alpine*. Polygonum viviparum, for instance, I have frequently seen at almost no distance from the sea, and at hardly any height above its level. Oxyria reniformis, Saxifraga aizoides, and, if I mistake not, Saxifraga stellaris also, are, like Alchemilla alpina, found at a great distance from their natural habitats, by the side of the river already mentioned. I believe the same is the case with respect to many other alpine productions, and with respect to every river that has its source among the hills.

When I had arrived at Loch Callader, and had learned from the occupant of the solitary abode at its northern extremity, the best way to Loch-na-gar, I proceeded along the western margin of the lake, where, as the same obliging individual informed me, most *weeds* are to be found. I was first struck with the minute leaves of Thalictrum alpinum growing among the stones and moss close to the water. I saw them in great abundance almost to the head of the lake, but I could not detect more than half a dozen perfect plants, and these almost entirely in fruit. The beautiful Saxifraga oppositifolia next attracted my attention; there were a good many tufts or patches of it, but few specimens in flower. It is said to flower in April and May, but I am quite satisfied that in this locality it was only coming into flower at the time I gathered it: and if I recollect rightly, a dried specimen which I received some years ago, was labelled as having been gathered in July. Of Tofieldia palustris I got just two specimens, and of Juncus triglumis only a few. The four plants just named I observed in no part of the ground I traversed, except along the margin of Loch Callader; but in that station I gathered also Saxifraga stellaris, the viviparous variety of Festuca ovina, and Apargia Taraxaci, now sunk into a variety of Apargia (or Oporinia) autumnalis. The lake itself seems to contain very little that may interest the collector of "weeds." At its southern end, or head, I observed a few plants of Utricularia vulgaris, not then in flower. I may here digress so far as to remark, that this plant occurs, very sparingly, in several localities on Deeside; and that in one locality at least, a moss in the parish of Banchory, U. minor is abundant: neither of these plants, so far as I know, flowered last season. To return to Glen Callader. The end at which the lake lies presents some interesting botanical ground, which I am sorry I had not time to visit. It is surrounded by high rocks, the clefts of which contained at the time a few patches of snow.

My route now lay over the shoulder of a ridge that skirts the east side of Loch Callader, and here commenced my ascent from this interesting locality to the still more interesting mass of rock and mountain named Loch-na-gar. Instead of at once climbing the nearest height, I made a considerable circuit through a sort of hollow to the northward; and, though for some time I could not see the top of the mountain, I felt pretty sure that I was gradually winding in the direction of it. In this zigzag ascent the first plant of any interest that I met with was a solitary bush of Betula nana. As it had neither flower nor fruit, and as I confidently expected to meet with more of it, I plucked but one specimen; more, however, I did not find. Lycopodium annotinum occurred sparingly. There was, as I have invariably observed in the alpine localities I have visited, abundance of Rubus Chamæmorus not flowering, and only a patch here and there partly in flower and partly in fruit. Imbedded in moss, which was saturated with the water of a perpetual spring, and near perpetual snow, I picked three specimens of a small plant, with a decumbent rooting stem and large blue flowers, and thought I had found the rare Veronica alpina, on examination, however, it appears to be no more than the variety of V. serpyllifolia which is termed humifusa; I could not detect another specimen. Dr. Murray, "without being certain" that this plant is distinct from V. serpyllifolia, has given it as a distinct species, " as it is at least worthy of a place among a group whose members press closely upon one another." To me it certainly appears distinct, and, if I mistake not, the capsule is *ovate*, and *longer* than the style. Dr. Murray observes—" This is by no means a very alpine plant, being found at Banchory, little more elevated than the sea, and at Glentanner, not much above the common level of the district. It is even met with in the neighbourhrod of Paris, in the *Bois de Boulogne*." This seems to confirm the idea that Veronica humifusa is a veritable species. I have never seen it except where I found it on Loch-na-gar, at least 2000 feet above the sea. In the same spot, and in other similar places, Epilobium alpinum, and especially a small variety of Saxifraga stellaris, abounded. The latter scarcely exceeds an inch in height, but the plant, according to its elevation and exposure, grows to all intermediate sizes between one inch and eight.

I next proceeded up the course of a very small stream, which, for the length of at least one hundred feet, ran under an enormous mass of snow. Near this, I picked a specimen or two of Sibbaldia procumbens, which was plentiful, but not all in flower. I was now, although I knew it not, on the very shoulder of Loch-na-gar, but had not succeeded in getting one glimpse of its top. I therefore crossed that shoulder, and also the head of a glen which separates the mountain from another ridge, and made towards the top of the latter, which I had some idea was that of Loch-na-gar. I thought, at all events, that by gaining the height before me I should be able to see where I was. In ascending towards it I gathered Vaccinium uliginosum without either flowers or fruit; I picked also a few specimens of Carex rigida. I had by this time nearly reached the top of the ridge, when, after having several times turned to survey my ground, I had the *pleasure* of seeing the indubitable peak, from which I had wandered, considerably to the north of the height on which I stood, and which is termed Craig-dhuloch. I saw moreover that I had actually been on the shoulder of Loch-na-gar, and had no difficulty in shaping out for myself a route to the top. In order to accomplish my *right ascension*, I had of course both to descend and to retrace my steps. In this retrograde movement I first gathered some specimens of Luzula spicata, from eight to ten inches in height. I lighted also upon a patch of a single-spiked Eriophorum, which I would fain have called E. capitatum, but have not been able to *make* it any other than the more common species, E. vaginatum. In reascending Loch-na-gar I gathered Gnaphalium supinum and Azalea procumbens, the latter, of course, in fruit. Before reaching the top I passed over a long mossy level, and again gathered Sibbaldia procumbens, which was here of larger size: Luzula spicata and Carex rigida abounded. I tore up a few specimens of Salix herbacea, both male and female; and also gathered Festuca vivipara, which ascends to the very summit of the mountain, and which, I may add, finds its way down the Dee as far as Banchory, seventeen miles from the sea. My ascent ended on the top of the natural pile of huge stones that forms the peak. I thought of *rhyming* — but I remembered that this was Byron's own "dark Loch-na-gar." Indeed, my thoughts on the subject, by a sort of ingenious anticipation, had occurred long before I ascended the mountain; and when actually "at the utmost top," I was so occupied with sheltering myself from the wind, with taking care of my hat, with the contemplation of the prospect around me, and with the very interesting exercise of demolishing some eatables,—that I had at the moment far more *reason* than *rhyme* in my pate.

After seeing all I could see, I began to descend on the north side, which is excessively steep, and strewed with large blocks of stone. Both at this time, and throughout the day, the wind blew with such violence, and in gusts so sudden, that I was frequently under the necessity of throwing myself on the ground, to avoid being driven along rather faster than was agreeable. I descended in a direction which brought me to the foot of the stupendous rocks which face the north. My time did not permit me to examine this locality; and although I scrambled round the end of the small lake that lies below, my path lying partly over sloping rocks, where a very small slip might have procured me a tolerable ducking, all I found was a variety of Melampyrum pratense with very pale yellow or white flowers, having the lip externally purple and the throat yellow. It is now so black, that one can scarcely say whether it has flowers or not. I ascended once more for a short distance in an easterly direction, crossed a low ridge over which I was partly blown by the wind, and then commenced my final descent towards the water of Muick, which I reached about 6 o'clock in the evening, at the distance of about two miles from the lake whence it issues. The only other plant worth picking with which I met after I was fairly away from Loch-na-gar, was a species of Hieracium which I take to be H. Halleri.* My friend Mr. Adams informs me, that in ascending towards Loch-na-gar from the same locality to which I descended, Dr. Murray and himself gathered the species last named; I could find but one specimen. The rest of my walk was of no interest to any one but myself, unless some good-natured sympathetic botanist should feel interested in the information that I continued my journey till half past 1 next morning, when I arrived, sadly way-worn, at the place whence I had started on the 13th.

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* Apparently just coming into flower; it nearly corresponds with our own specimens of this plant from Ben-na-bourde, collected in August, 1831.—*Ed.*

The above, I fear, will be considered but a meager concern: another day, and a knowledge of the Cryptogamia, of which I am ignorant, would have done much to render even my hasty excursion more interesting. Morven, another mountain celebrated by Byron, which I visited in 1841, does not present so wide a field as Loch-na-gar; it possesses, however, considerable interest. By the side of a small stream at its base I found the beautiful Sedum villosum, which I did not detect either on Loch-na-gar or in its vicinity.

Forres, March 8, 1843. J. B. BRICHAN.

ART. CXXX.—*A List of Mosses and Hepaticæ collected in Eskdale, Yorkshire.* By RICHARD SPRUCE, Esq.

YORK has been said by Mr. H. C. Watson to be "pre-eminently the county of ferns;" and I think I may venture to assert that it is equally unrivalled in its mosses and Hepaticæ. In proof of this I refer to the valuable list of mosses in Baines's 'Yorkshire Flora,' the result chiefly of the investigations of Messrs. Gibson, Nowell, Howarth &c. in a very small portion of the county. Since Mr. Baines's work was published, several most interesting species have been discovered, and still a considerable part of the county remains unexplored. Our dales, which afford a passage for a multitude of impetuous streams, are peculiarly prolific; and I have assigned to myself the pleasing task of exploring them, in turn, as opportunity shall offer. The vale of the Esk, whose partial examination I have now to detail, terminates at Whitby, fifty-one miles N.E. of York; the river flows nearly due east, and receives during its course several smaller streams, issuing from a like number of dales. The Whitby and Pickering railway enters Eskdale at Grosmont Bridge; and from hence to Whitby (six miles) the country is well wooded, and may be called romantic. The course of the river forms a series of almost semicircular curves, now on the right now on the left of the railway, which crosses it I suppose ten times in that distance; the south side of these curves is frequently a perpendicular cliff, rising directly from the water's edge to a height of from 30 to 150 feet; and having a northern exposure, is richly clad with mosses and Hepaticæ. These cliffs are farther interesting from being in the line of the remarkable fault which extends from Whitby Harbour to the plain of Cleveland; Dr. Young, in the 'Geology of the Yorkshire Coast,' has estimated the amount of dislocation to be about 100 feet at the mouth of the Esk, and in some places it is probably more. The formation is the inferior oolite, and consists of beds of alum shale* alternating with ironstone and sandstone. Goadland beck (or the Mirk Esk) joins the Esk just above Grosmont bridge, and Lythe beck (the sweetest spot in the whole district) runs into Goadland beck about half a mile higher up. These two becks are crossed by the great basaltic dyke; but it scarcely rises above the surface, and does not appear to produce any peculiar plants.

I devoted two days (the 30th and 31st of December, 1842) to the examination of the banks of the Esk and its tributaries above mentioned. On the morning of my third and (as it proved) *last* day's botanizing, I proceeded per railway to Fen End, an extensive peat-moss twelve miles west of Whitby, where Goadland beck has its source;† here I encountered a snow-storm, and although I persevered in examining the rocks on the south side of Newtondale (great oolite) until they, as well as myself, were clad in white, I was eventually compelled to desist. I regretted the necessity of this the more, as I had planned out work for other five or six days; perhaps its completion is a treat yet to come.

Note.—I have not annexed the localities to those species which occurred in every spot I visited, and which are generally distributed throughout the county.

Gymnostomum truncatulum.

——— *curvirostrum.* Newtondale; barren. I gathered a moss on wet rocks by the Esk, almost intermediate in size and appearance between this species and Anictangium Hornschuchianum. I saw the same plant last summer in Dr. Taylor's herbarium, under the MS. name of G. nimbosum; he has long known it on Mount Mangerton, but has never met with fruit. Mr. Ibbotson finds it on Pennyghent, and Mr. Nowell in Todmorden, but always barren. In a dried state the leaves are remarkably brittle, so that on opening a package of it, I always find numbers of them broken off and strewed about.

Tetraphis pellucida. Lythe beck.

——— *Browniana.* Newtondale; with old fruit.

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* The alum-works near Whitby have been celebrated for centuries, and at Grosmont great quantities of iron ore are got up and sent to Newcastle to be smelted at the founderies.

† Another stream rises in this bog, which, although it eventually reaches the same sea, runs in an opposite direction.

Weissia tenuirostris, H. & T. On stones in Lythe beck; barren.
—— *curvirostra*, *controversa* and *recurvata*.
—— *verticillata*. Near the waterfall in Goadland beck; in fruit.
Grimmia apocarpa and *pulvinata*, and *Didymodon purpureus*.
Didymodon Bruntoni. Newtondale; fruit just rising.
—— *rigidulus*. Goadland beck; in fruit.
Trichostomum lanuginosum, *heterostichum* and *fasciculare*. All fruiting on an old wall in the vale of Goadland.
—— *aciculare*. On stones by the Esk and Goadland beck; abundant.
Dicranum bryoides, *adiantoides*, *taxifolium*, *flexuosum*, *scoparium* and *heteromallum*.
—— *glaucum*. Egton moors.
—— *flavescens* and *pellucidum*. Abundant, and with fruit in a good state, by the Esk and Lythe beck. I observed a large variety of the latter, not readily to be distinguished from D. flavescens.
—— *varium*. Two or three varieties.
Tortula muralis, *ruralis*, *subulata* and *unguiculata*.
Polytrichum undulatum, *commune*, *aloides* and *nanum*, and *Funaria hygrometrica*.
Orthotrichum affine, *striatum* and *crispum*.
Bryum albicans. Frequent on wet rocks by the Esk; barren. This plant is remarkably fragile; two or three times I thrust my stick into the broad flakes above my head, hoping to procure a patch entire, but I only brought down a shower of mutilated stems around me.
—— *argenteum*, *capillare*, *cæspititium*, *ventricosum*, *ligulatum*, *punctatum* & *hornum*.
—— *marginatum*. Lythe beck; scarce.
Bartramia pomiformis and *fontana*, and *Leucodon sciuroides*.
Daltonia heteromalla. On an apple-tree at Eskdaleside; in fruit.
Fontinalis antipyretica. In the Esk &c.
Hookeria lucens. Goadland beck.
Hypnum trichomanoides, *complanatum*, *undulatum* and *denticulatum*.
—— *medium*. At the roots of trees by the Esk.
—— *serpens* and *populeum*. The latter rather scarce.
—— *purum*. In fruit near Lythe beck.
—— *piliferum*. Abundant, but without fruit.
—— *catenulatum*. A single tuft on a wet cliff by the Esk.
—— *plumosum*. The most frequent moss in Eskdale.
—— *Schreberi*, *sericeum*, *alopecurum*, *dendroides*, *curvatum*, *myosuroides*, *splendens*, *proliferum* and *prælongum*.
—— *flagellare*. Abundant by the Esk and Goadland beck, but I saw no fruit.
—— *rutabulum*, *velutinum*, *ruscifolium*, *cuspidatum* and *squarrosum*.
—— *confertum*. Frequent. A large variety on stones in the streams, with the leaves sub-bifariously arranged and nearly entire.
—— *loreum* and *triquetrum*. Fruiting in Newtondale.
—— *filicinum* and *commutatum*. In great profusion on wet rocks.
—— *palustre*, *aduncum*, *cupressiforme* and *molluscum*.
—— *multiflorum*, Fl. Hib. On trees in Eskdale, and on a wall in the village of Egton, but scarce.
Marchantia conica and *Jungermannia asplenioides*.
Jungermannia lanceolata, L. On wet rocks by the Esk, and with calyces on stones in

Lythe beck. The existence of this plant in Britain was formerly doubted; Sir W. J. Hooker says — "I have never seen British specimens; and I suspect the authors just named (Hudson, Withering, &c.) may have mistaken some other species for it;" (see Brit. Jung. and Eng. Flor.) I believe its claim to a place in our Flora was satisfactorily established a few years ago by Mr. Jenner, who found it at Tonbridge Wells. Its closest affinity may be with J. pumila, but in my deliberate opinion J. polyanthos is the species for which it is most likely to be passed over; I found the two plants growing intermixed, and certainly differing very little in size and general appearance. In J. lanceolata the *stems* are procumbent, and copiously furnished with strong radicles on their under side. The *leaves* are horizontal, but slightly deflexed (except the two or three terminal ones, which are vertically folded together, as we sometimes see the leaflets in leguminous plants), longer than broad by about one half, and of nearly equal breadth from the base to near the summit, where they are rounded off, or rarely somewhat retuse; their colour brownish. The *calyx* is terminal, one third longer than the perichætial leaves, curved upwards, subcylindrical, broadest at the summit, where it is remarkably depressed, with a very minute slightly elevated mouth. Jung. polyanthos is altogether of a greener hue; the stem is more slender; the leaves mostly shorter, still more quadrate in their form, and often emarginate, the reticulation is also closer. Besides these marks of distinction, there are the more important ones of the presence of *stipules* (though unusually small in proportion to the leaves), and the curious two-lipped calyx with its much exserted calyptra, which will always suffice to keep this species far apart from J. lanceolata. The plant mentioned in my list of Wharfedale mosses (Phytol. 197) as an entire-leaved variety of J. asplenioides,* is not unlike J. lanceolata in appearance, but the calyx is totally different.

Jungermannia riparia, Taylor, MS. On wet rocks by the Esk; with calyces. This species, which has very lately been distinguished by Dr. Taylor, was first detected by him at the Dargle, Co. Wicklow; and I had the pleasure of gathering it in his company last July, at Blackwater Bridge, Co. Kerry. It is intermediate in size between J. cordifolia and J. pumila, and has some points of resemblance to each, but differs from both in its obovate very obtuse calyx. I have gathered it in two other Yorkshire stations, namely, Wharfedale and Crambeck on the Derwent, and Mr. Nowell sends it from Todmorden.

———— *sphærocarpa*. Abundant, but sparingly in fruit. I observe that the young calyx has a short tubular mouth, without any trace of teeth.

———— *hyalina*. Equally common with the last, and growing intermixed with it, but distinguished by its larger size and purplish tinge, by the broader and more wavy leaves, by the vertically compressed and angulate calyx, and, above all, by the perichætial leaves growing upon, or adhering to, the calyx.

———— *emarginata*. Eskdale and Newtondale. I found a few capsuliferous specimens.

———— *inflata* and *excisa*. With calyces on Egton moors. A small variety of the latter in Newtondale, with nearly all the leaves trifid.

———— *bicuspidata*, *nemorosa* and *albicans*. With calyces.

———— *umbrosa*. Newtondale and woods round Grosmont bridge. This beautiful and rare species might easily be overlooked as a young state of J. nemorosa, from which it is, however, truly distinct.

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* Mr. Wilson considers this to be a distinct and undescribed species.

Jungermannia complanata and *scalaris*. In fruit.

———— *polyanthos*. By the Esk and Lythe beck; with calyces.

———— *Trichomanis* and *bidentata*.

———— *reptans* & *platyphylla*. A solitary tuft of each observed in Newtondale

———— *laxifolia* & *trichophylla*. Near the waterfall in Goadland beck; calyces

———— *dilatata*, *Tamarisci*, *pinguis*, *epiphylla* and *furcata*.

———— *Lyellii ?* Near the waterfall in Goadland beck, growing upon Hypnum commutatum. This approaches nearest to the variety called J. hibernica by Hooker, but is above twice the size of any specimens in my possession under either name, and the perichætium (or outer calyx) is longer, with repeatedly laciniated segments. I found plenty of pistilla but no fruit, the season being too early.

A remarkable circumstance in the cryptogamic Flora of Eskdale is the total absence of the genera Neckera and Anomodon; whereas in other districts of similar appearance, but at a distance from the eastern coast, such as Wharfedale, Castle Howard, &c., I have found the two species of Anomodon and two of Neckera (N. pumila and crispa) distributed in tolerable plenty; and the abundance of N. viticulosum is generally characteristic. Jungermannia reptans and platyphylla also, plants which are usually so abundant in rocky situations, do not appear to exist in Eskdale; their sparing occurrence in Newtondale has been remarked above, but this is fourteen miles from the sea, and belongs to another system of drainage. RICHARD SPRUCE.

York, February 17, 1843.

ART. CXXXI.—*Remarks on the threatened extermination of rare Plants by the rapacity of Collectors.* By S. H. HASLAM, Esq.

Milnthorpe, Westmoreland,
March 7th, 1843.

"Fortunati ambo, si quid mea carmina possunt."

SIR,

I HAILED the first appearance of 'The Phytologist' with pleasure, as I thought it promised to supply a desideratum much wanted in our scientific periodicals, and would afford to many a plodding botanist, as yet "unknown to fame," an opportunity of recording his observations in a less formidable manner than by drawing attention to himself in a publication of higher pretensions, if, indeed, he had the chance of seeing such a book at all. I dare say there are few of us who have not within the range of our acquaintance some one or other, the result of whose labours we have often wished could be made available for the general good, but whose habits of retirement, or, it may be, the "res angusta domi," had always kept in the back ground. Now, your useful little publication seems just adapted for the very purposes I allude to, and I think I am justified in saying, that the expectations of both editor and contributor must have been very fairly realized; and I am glad to think that the pages of 'The Phytologist' have recorded many valuable hints, and put your readers in possession of much pleasing information respecting Botany and botanists.

Having premised thus much, let me draw your attention to another part of the subject, less gratifying indeed (for every medal has its reverse), but which I trust you will see in the same light as myself; and as 'The Phytologist' is the avowed organ of enlightened science and practical Botany, permit me, through the medium of its pages, to awaken a sympathetic feeling in favour of those very treasures that are the objects of our favourite pursuit. And let me, ere the botanizing season has commenced, impress upon the minds of collectors the desirableness of forbearance and moderation, when culling specimens for their herbaria, — particularly amongst what are rapidly becoming the "plantæ rariores" of our island. I frequently caution brother botanists on this head, and seldom get more than a smile in return. But if the legitimate end of Botany be a more intimate acquaintance with plants in a growing state; and if it be more delightful to feast our eyes on these gems of the earth in the garden of Nature, than to handle a dry and often disfigured specimen in the herbarium of a botanist;— surely it is a matter of grave moment, that the war of extermination which has lately been waged against our best and rarest plants, should at length be put an end to.

Some of your readers may perhaps say that I am fighting with a shadow, or that my own alarms have pictured an exaggerated state of things; but when I see a recently-formed Society, determined, I suppose, to outstrip all others in the work of extermination, putting forth a list, including *some* of the rarest of our indigenous plants, and desiring its contributors to send no more of them, as there are enough on hand to distribute for several years;—can it be said that my fears are altogether groundless? What pretty picking there must have been, to amass such a lot of treasures! And the machinery by which such a system is kept alive, is not less alarming. Tradesmen, who cannot devote the time to it themselves, or else are verily ashamed of being caught at it — "palmam qui meruit ferat."— send forth their apprentices to dig up *every* specimen they can find, of certain rare plants in their locality, and these are bundled off until the market is actually glutted.

Yet more startling facts I could adduce, but I trust that I have said enough to awaken attention to the subject. What can be more painful to the true and ardent lover of Botany, than to find those spots where Nature has, as it were, secreted her choicest gems, visited only for the purposes of plunder and filthy lucre? I could name many plants that, not long ago, were plentiful in this neighbourhood, but which, since the establishment of railroads and learned Societies, have become nearly extinct. The interests of science surely do not require such barbarous work, and her legitimate sons, I am equally certain, would not sanction it.

I think I may venture to assert, without fear of contradiction, that no small portion of the pleasure arising from botanical pursuits, consists in the toil and enthusiasm of a botanical ramble; and those specimens are most highly prized that have cost us most personal exertion to obtain. But it is no uncommon thing, now-a-days, to see a collection made up entirely of "contributions from friends;" and by the system I am complaining of, a herbarium may be made up "on the shortest notice," and without costing its possessor one hour's fatigue in the way of genuine Botany. All this may be well enough, if confined to the commoner plants, but I really regret to see our darling science degraded into a mere handmaid of "commerce and trade," with the additional mortification of knowing that, one by one, our rarest plants are disappearing from their long-recorded habitats: —

"Oh infelix operis summa!"

Hoping that these remarks may be taken in good part by all the *real friends* of Botany,

I remain, Mr. Editor,
Your most obedient Servant,
S. H. Haslam.

To the Editor of 'The Phytologist.'

Art. CXXXII. — *Observations on the publication of Local Lists of Plants.* By Edwin Lankester, Esq., M.D., F.L.S. & B.S.Ed.

In prosecuting the subject of the distribution of plants, it is exceedingly desirable that correct lists of the species that grow even in small districts should be obtained. The value of lists of plants from small districts must, however, be always proportioned to the variety of soil, elevation, climate, &c., which the district may possess. Thus a list of plants from a small district of level or swampy ground, would not furnish so much valuable matter as a list from a smaller district where streams or hills produced a difference in the dryness and constitution of the soil. Take for example the neighbourhood of Askern, a small district of Yorkshire, the centre of which is seated in about the middle portion of the great escarpment of magnesian limestone, which runs through the counties of Nottingham, York and Durham. Its extent is about four miles east and west, and two miles north and south. To the east, the magnesian limestone dips under the new red sandstone, which is covered in this district by an immense swamp. Directly through the district, in a south-easterly direction, runs the river Went, making its way along a picturesque valley, which passes at right angles through the magnesian limestone formation. The river is here about thirty feet above the level of the sea, and the highest hills above its banks are about three hundred and eighty feet. The villages of Campsall, Burghwallis and Smeaton are seated entirely on the magnesian limestone, whilst Sutton, Askern and Norton include some of the marshy districts lying above the new red sandstone.

In publishing lists of plants of particular districts, botanists have for a long time felt the inconvenience of going over a number of the names of plants which are common to almost all districts; and yet, as no rule has been offered which would answer generally for the exclusion of common plants, all plants must be included in lists of any value.

In drawing up a Flora for my 'Account of Askern,'* I have endeavoured to obviate this difficulty; and I am not without hope that the idea acted on may be found generally applicable, at least to Great Britain, and that it will lead to the more general publication of local Floras, which will supply material for the perfecting our knowledge of the geographical distribution of plants.

In the Flora alluded to I have distributed the plants in four tables. In the first table is a numerical statement of the genera and species of each natural order. From this it will be seen that there are 428 species of phanerogamic plants, belonging to 212 genera and 78 natural families. The second table contains a list of the plants that more particularly distinguish the district. In drawing up this table, those species have been selected that are admitted into Mr. Watson's 'New Botanist's Guide,' which contains only the plants found not to be common to eight out of twelve local Floras of Great Britain. I have followed Mr. Watson in this respect, not because I think his list the best that could be constructed, but because his book is very generally known to botanists in this country. Since the publication of Mr. Watson's book, other Floras have been published, and materials furnished for a more correct list of common plants than he has given; and I would suggest that it might be worth the while of some of our botanical societies to construct a list, which, by excluding common plants, would enable the botanist to publish only the peculiar and most interesting forms. But these two tables, even with Mr. Watson's Guide and a British Flora, would give only an incomplete view of the Flora of a particular district, since many of the common as well as of the rarer plants might be absent from it. In order to meet this defect, I have constructed a third table, including the plants which were common to the twelve counties examined by Mr. Watson, but which I did not find near Askern. In the present case I believe this table to be somewhat imperfect, but I have mentioned it in order to show the manner in which my plan may be carried out. With these three tables, a list of British plants, and Mr. Watson's Guide, we have the elements of a complete Flora of a district.

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* An Account of Askern and its Mineral Springs; together with a Sketch of the Natural History, and a Brief Topography of the Immediate Neighbourhood. By Edwin Lankester, M.D., F.L.S., &c. London: Churchill, Princes St., Soho. 1842. A very neat little book, evidently got up with great care on the part of the author, and containing much information relative to the Antiquities, Topography and Natural History of Askern and the surrounding district.—*Ed.*

There is, however, one point in which such a Flora would be defective, and that is the comparative rarity or frequency of the excluded common plants. This is, however, always a difficult point to estimate, and little has hitherto been done towards enabling us to compute, with any proximity to the truth, the number of individual plants growing in a district. In my fourth table, by way of meeting in some measure this inconvenience, I have added the names of a few plants which are rare in the Askern district, but which are excluded as common from Mr. Watson's list. EDWIN LANKESTER.

19, Golden Square,
January, 1843.

[We are greatly obliged to Dr. Lankester for his valuable suggestions; the adoption of his plan would, however, involve the necessity of printing at least *four* lists instead of *one* for every district illustrated. The subject of publishing local lists of plants is one which has often had our serious consideration. For various reasons we have hitherto preferred printing them exactly as received from the contributors, to whom our thanks are due for the pains they have taken to render their lists correct and complete. The following considerations have had great weight in inducing us to publish these lists without mutilation. Botanists confessedly require more exact information than they at present posesss, on many points relating to the general distribution of plants, common as well as rare. In all matters connected with this subject, we know of no botanist whose opinions are more worthy of regard than those of Mr. Watson; and that gentleman, at no very distant period, has well observed, that owing to the want of sufficient data we are as yet unable to say with certainty, that even such common and widely spread plants as the daisy and the dandelion are to be found in every county of the United Kingdom. Such data it is the province of local lists to supply, and we would have them include the name of every species growing in the district to which they refer. For our own part we can truly say, that if carefully drawn up, and more especially if they contain short remarks on any interesting circumstances connected with the species, our only objection to these lists arises from the fear that some of our subscribers may think that their place would be better occupied by matter more generally readable. We shall be glad to receive communications on this subject; but until some better plan be determined on, we trust we shall be excused if we "e'en gang our ain gate," printing the lists of flowering plants, mosses, &c. entire, and in future transferring localities of ferns to Mr. Newman, for publication in his county lists.—*Ed.*]

ART. CXXXIII.—*Notice of 'A Visit to the Australian Colonies. By* JAMES BACKHOUSE.' London: Hamilton, Adams & Co. 1843.

To a considerable number of our readers it is well known that the author of this work is a member of the Society of Friends, and that his visit to the Australian colonies was undertaken "for the purpose of discharging a religious duty." But our notice of this narrative will be confined to that part of it which is strict accordance with the design of 'The Phytologist,' namely, the author's observations on the vegetable productions of these colonies; and we trust that we shall be able to show that James Backhouse is an observant and accomplished botanist. To many of our readers who are acquainted with this excellent man, his profound botanical knowledge is already well known; still, even to these, our remarks may not be unacceptable, since they will collect, and somewhat condense, observations on this interesting science, which are scattered through a volume of 560 pages. The visit "occupied a period of six years, terminating with 1838." We shall divide our notice into three parts:— Van Diemen's Land, Norfolk Island and New South Wales.

VAN DIEMEN'S LAND.—As far as Botany is concerned the narrative commences at Hobart Town, where the author landed in February, 1832, and our first botanical sketch is of a hill near that town. This hill—

> "Was clothed with gum trees—species of Eucalyptus—of large size, having foliage somewhat like willows, and growing among grass and small shrubs. Many trees

were lying on the ground, and in various stages of decay. Smaller trees, called here honeysuckle, she oak, cherry-tree, and wattle, were interspersed among the others, and the ground was decorated with Leptospermum scoparium, Corræa virens, Indigofera australis, and Epacris impressa; the last of which resembles heath, with white, pink, or crimson flowers. The trees in this country often bear the name of others belonging to the northern hemisphere. Thus the honeysuckle of the Australian regions is generally some species of Banksia, often resembling a fir in growth, but having foliage more like a holly; and the cherry-tree is an Exocarpos—a leafless, green, cypress-like bush, with small red or white fruit, bearing the stone outside!"—p. 22.

Speaking of introduced plants the author observes that the climate at Hobart town is too cold for grapes and cucumbers, but that apples, pears, quinces, mulberries and walnuts succeed better than in England. On the basaltic hills about Hamilton, the prevailing tree is the oak — Casuarina quadrivalvis. "It seldom grows in contact: its trunk is about 10 feet high and 5 feet round; its head is spherical, and 10 or 15 feet in diameter, and consisting of pendulous, leafless, green, jointed twigs, resembling horse-tail weed." At Mount Wellington, Acacia Oxycedrus, 10 feet high, was in flower. "This, along with numerous shrubs of other kinds, formed impervious thickets in some places, while, in others, Epacris impressa displayed its brilliant blossoms of crimson and rose-colour." We pass on to the description of a fern valley, which is almost enough to make a botanist emigrate to this distant land. In the plate accompanying this sketch the author is seen crossing the stream on the trunk of a fallen Eucalyptus; how we long to be his companion! Loddiges and Ward, what would you not give to realize such a scene!

"The brook that supplies Hobart Town with water, flows from Mount Wellington through a valley at the foot of the mountain. Here the bed of the brook is rocky, and so nearly flat as scarcely to deserve the name of The Cascades, by which this place is called. Many dead trees and branches lie across the brook, by the sides of which grows Drymophila cyanocarpa — a plant allied to Solomon's seal, producing sky-blue berries on an elegantly three-branched nodding top. Dianella cærulea—a sedgy plant — flourishes on the drier slopes: this, as well as Billardiera longiflora — a climbing shrub, that entwines itself among the bushes — was now exhibiting its violet-coloured fruit. In damp places by the side of the brook, a princely tree-fern, Cybotium Billardieri, emerged through the surrounding foliage. A multitude of other ferns, of large and small size, enriched the rocky margins of the stream, which I crossed upon the trunk of one of the prostrate giants of the forest, a gum-tree of large dimensions, which had been uprooted by some blast from the mountain; and in its fall had subdued many of the neighbouring bushes, and made a way where otherwise the forest would have been inaccessible. On descending from this natural bridge, to examine a tree-fern, I found myself at the foot of one of their trunks, which was about five feet in circumference and ten feet in height. The lower part was a mass of protruding roots, and the upper part clothed with short remains of leaf-stalks, looking rough and blackened: this was surmounted by dead leaves hanging down, and nearly obscuring the trunk from distant view: above was the noble crest of fronds, or leaves, resembling those of Asplenium Filix-fœmina in form, but exceeding eleven feet in length, in various degrees of inclination between erect and horizontal, and of the tenderest green, rendered more delicate by the contrast with the dark verdure of the surrounding foliage. At my feet were several other ferns of large size, covering the ground, and which, through age and their favourable situation, had attained root-stocks a foot in height, crowned by circles of leaves three times that length. Other plants of tree-fern, at short distances, concealed from my view, by their spreading fronds, the foliage of the lofty evergreens that towered a hundred feet above them. The trunk of one of the tree-ferns was clothed with a Trichomanes and several species of Hymenophyllum—small membranaceous ferns of great delicacy and beauty. On a rocky bank adjoining, there were other ferns, with creeping roots, that threw up their bright green fronds at short distances from each other, decorating the ledges on which they grew. In the deepest recesses of this shade I could enjoy the novel scene—ferns above, below, around—without fear of molestation; no dangerous beasts of prey inhabiting this interesting island." —p. 34.

On leaving Hobart Town the author sailed to Port Davey, and thence to Macquarie Harbour, where he describes the timber as being very fine. The Huon pine, valuable for ship-building &c., abounds on the eastern side; it attains a height of 100 feet, and a circumference of 25 feet; it has a pyramidal shape, and the branches are clothed with numerous slender scaly branchlets of lively green, as in the cypress and arbor vitæ. The celery-topped pine—Thalamia asplenifolia—is suitable for masts; myrtle for keels; and the roots of light-wood—Acacia Melanoxylon—make beautiful veneers. This latter wood derives its name from swimming in the water, the other woods, pine excepted, generally sink. Hats are made of the shavings of some Acacias, "as well as from broad-leaved sedges—Lepidosperma gladiata; the leaves being first boiled and bleached." At Philips Island, in the same vicinity, we have another peep at the tree ferns.

"The huts were almost overgrown with the Macquarie Harbour vine, a luxuriant climber, bearing small acid fnit. We walked over the island, and down one of its sides, which was woody, and which exhibited the finest tree-ferns we had seen, and in great profusion. They were of two kinds, one of which we did not meet with elsewhere. Some of their larger fronds or leaves were thirteen feet long, making the diameter of the crest twenty-six feet. The stems were of all degrees of elevation, up to twenty-five or thirty feet; some of them, at the lower part, were as stout as a man's body: those of Cybotium Billardieri were covered with roots to the outside: the whole length of those of the other species—Alsophila australis—was clothed with the bases of old leaves, which were rough, like the stems of raspberries, closely tiled over each other, and pointing upwards. There was also a number of other ferns, of humble growth: two species of the beautiful genus Gleichenia had tough, wiry stems, which were used in the settlement for making bird-cages."—p. 55.

At Macquarie Harbour and Port Davey a species of Blandfordia was observed, a lily-like plant, with a crest of scarlet tubular flowers: and on the hills near the former place, was a lichen of a texture resembling net-work; this, "in the abundant rain, was distended into masses resembling cauliflowers." "In some places —— cyperaceous plants entwine themselves among the larger shrubs and ascend to their tops, and lichens hang to a great length from the boughs of some of the trees."

Returning by sea to Hobart Town, our author made an excursion on the opposite side of the river to that on which the town stands: he notices the appearance of Anguillaria dioica, a little, purple-spotted, white-blossomed, bulbous plant, which was decorating a sunny bank as one of the first harbingers of spring, (August 27th); and also comments on the strange appearance of trees in full foliage laden with snow. It is, we presume, generally known, that the trees of Australia may nearly all be regarded as a kind of evergreens, although not so strictly entitled to that name as those so commonly cultivated in our English gardens.

On the 26th of September J. Backhouse sailed for Flinder's Island, of which he records nothing botanical that is particularly worthy of notice. On the 20th of October he reached George Town, on the main land of Tasmania; on the 30th Circular Head, and on the 31st Woolnorth. The seaweeds of this shore are of prodigious magnitude; one, "a palmate species, has a stem thicker than a man's arm, and proportionately long. The flat portion between the stem and the ribbon-like appendages is so large as to be converted by the blacks into vessels for carrying water. For this purpose they either open an oblong piece so as to form a flat bag, or run a string through holes in a circular piece, so as to form a round one." Returning to Circular Head he proceeded thence by land to Emu Bay, noticing by the way the grass-trees, to which we shall again recur, and a beautiful Blandfordia, whose stems were eighteen inches high, and supported crests of from ten to twenty pendulous red blossoms, margined with yellow, an inch and a half long, and three quarters of an inch wide at the mouth. On some of the hills Banksia serrifolia was the prevailing tree; "it is equal to a pear-tree in size, has leaves three or four inches long and five-eighths broad, and strongly toothed: its heads of flowers are six inches long and twelve round, and the seeds are as large as almonds." After a short rest at Emu Bay,—

"We set out for the Hampshire Hills, distant 20½ miles, through one of the most magnificent of forests. For a few miles from the sea, it consists chiefly of white gum and stringy-bark, of about 200 feet in height, with straight trunks, clear of branches for from 100 to 150 feet; and resembling an assemblage of elegant columns, so irregularly placed as to intercept the view at the distance of a few hundred yards. These are elegantly crowned with branching tops of light willow-like foliage, but at an elevation too great to allow the form of the leaves to be distinguished, yet throwing a gentle shade on the ground below, which is covered with splendid tree-ferns and large shrubs, and carpeted with smaller ferns. Some of the larger stringy-barks exceed 200 feet, and rise nearly as high as 'the monument' before branching. Their trunks also will bear a comparison with that stately column, both in circumference and straightness. The bark of these trees is brown and cracked: that of the white-gums is French grey, and smooth.

"The prostrate trunks of these sylvan giants, in various stages of decay, add greatly to the interest of the scene. Some of them, lately fallen, have vast masses of the rich red earth in which they grew, still clinging to their roots; others, that have been in a state of decay before they fell, present singular ruins of shattered limbs and broken boughs; others, that seem to have been in a state of decomposition for ages, have become overgrown with various ferns and shrubs.

"As the distance from the sea increases, the Australian myrtle and sassafras, of dark dense foliage, become the prevailing trees. In these denser forests, tree-ferns form nearly the sole undergrowth, except the small, starry ferns, of low stature, of the genus Lomaria, that cover the ground thinly. Some of the tree-ferns have trunks 20 feet high. Their leaves are from 8 to 12 feet long, and the new ones, now forming, rise in the centre like elegant crosiers."—p. 111.

(To be continued).

ART. CXXXIV.—*Varieties.*

270. *Note on the occurrence of Cuscuta Epilinum and Saponaria Vaccaria in Morayshire.* In July, 1842, Mr. Wilson of Alves detected these two plants in a field of flax, in the parish of Alves, Morayshire, along with Camelina sativa. Mr. Babington's remark (Phytol. 250) that C. Epilinum does not make its appearance among flax raised from American and Riga seed, led me to enquire whence the seed in the present case was imported. I am informed that all the flax-seed used in this district is procured either from America or Holland; that those who are in the habit of using both, can distinguish American seed from Dutch by the *rounder* shape of the former; and that the seed respecting which I made the enquiry, was the remains of a cargo which had been cleared out at London, was obtained from the vessel on its arrival at Burghead (a small port on the Moray Frith), and was considered to be American on the ground just mentioned.—*J. B. Brichan; Forres, February* 14, 1843.

271. *Note on a supposed new British Æcidium.* Last August I found at this place a species of Æcidium, which is not noticed in

Hooker's 'English Flora,' our text-book for British cryptogamous Botany. On referring to Gray's Natural Arrangement, I found the description of an Æcidium that in some respects answers to mine, of which I could secure but three specimens, as the season for it appeared to be nearly over. The following is Gray's description.—

" *Æcidium asperifoliarum.* Thecæ confluent, wine-glass shape, half immersed, pale yellow; sporidia yellowish white. *Æcidium asperifoliæ*, DC. Syn. 50. On the lower face of various Borragineæ. Leaves hollowed on the upper face."

My notes are as follows :—

Æcidium ——? Spots yellowish, disfiguring and incrassating the leaves. Pseudo-peridia generally hypogynous, sometimes amphigenous, more or less confluent: sporidia orange. On Lycopsis arvensis. Thame, August 24, 1842.

I am uncertain whether the difference in the colour of the sporidia will constitute a new species; in other respects it agrees pretty well with DeCandolle's.—*Ph. B. Ayres, M.D.; Thame, Feb.* 22, 1843.

272. *Note on the Fruit of Umbelliferæ.* Before I close my note I wish to make a remark on the discussion in your journal concerning the poisonous properties of the seeds of Umbelliferæ. Lindley's statement is copied from DeCandolle's Essay on the Medical Properties of Plants, and DeCandolle is certainly in error. I think the most accurate view on this subject is, that those seeds in which vittæ are present are innocuous, while those which have no vittæ are either suspicious or poisonous. In the former, the proper juice of the plant is converted into volatile oil; in the latter, it is merely deposited in a more concentrated form.—*Id.*

273. *Note on Gigartina compressa.* My attention having been directed to some remarks on the Jusna or Ceylon moss, by M. Guibourt of Paris (Provincial Medical Journal for February, 1843, No. 128), I am induced to trouble you with some observations made by me on this plant many years since, when it occurred in considerable abundance at Sidmouth, as they agree so entirely with those of M. Guibourt, that there can be no doubt of their identity. The species in question is the Fucus lichenoides of Turner, described and figured in his 'Historia Fucorum,' ii. 124, t, 118; the Gracilaria lichenoides of Greville's 'Cryptogamic Flora,' p. 125, from specimens and a drawing of the recent plant, communicated by me from Sidmouth, Fucus lichenoides of Linn. &c. Subsequently, finding it agree with Sphærococcus compressus of Agardh, and that the term lichenoides was preoccupied and inappropriate, Dr. Greville named it Gracilaria compressa in his 'British Algæ;' and it is now Gigartina compressa of Hooker's 'British Flora,' 299, Harvey's 'Manual of British Algæ,' 74,

and Wyatt's 'Algæ Danmonienses,' iii. No. 108. *Mem.*- "Sidmouth, 1827. Turner's description of this plant is better than the figure, which is evidently from a bleached specimen. It has been abundant here from June to October, often twelve inches high, in fine fructification, capsules and granular imbedded seeds on distinct plants. The substance when fresh is cartilaginous but tender, full of moisture and brittle, breaking with the slightest touch, and shrinking to less than half its size in drying, and does not recover on subsequent immersion. It is cylindrical in the upper, compressed in the lower branches. When most plentiful I tried several experiments with it. Boiled in water it became of a most beautiful semitransparent green colour, and ate like delicate French beans, with a peculiar crispness and very agreeable taste. It did not dissolve after boiling seven hours, but lost much of its size. Vinegar nearly dissolved it, and changed the colour to yellowish brown. Boiled in syrup of preserved apricots it became a little yellowish, but retained its crispness and was extremely good: and having but little flavour of its own it might be made to taste of lemon, ginger, &c." I enclose part of two plants in the different modes of fructification. As a British species I would remark that its nearest affinity on the one hand is with Gigartina confervoides, on the other with Rhodomenia polycarpa of Greville (the Fucus Sarniensis of Turner). This last species has a much more compressed, nearly flat and broader frond, but the structure and fruit are the same, and on this account, in a future arrangement, it will doubtless be referred to its proper genus.—*Amelia W. Griffiths; Torquay, March* 1, 1843.

274. *Enquiry respecting Orchis hircina*, Scop., *and Orchis macra*, Lindl. May I enquire if any kind friend can favour me by mentioning any recently verified locality for either of these remarkable species? The first-named is said to occur in the neighbourhood of Dartford, but I am not aware of any living botanist having gathered it. Both species are noted in the books as Kentish plants.—*Edward Edwards; Bexley Heath, Kent, March* 4, 1843.

275. *Warwickshire locality for Equisetum fluviatile.* I fully expected some correspondent would have given a locality for Equisetum fluviatile, and am sorry I did not send a solitary station for the Warwickshire list of ferns. It was discovered in a damp copse near Elmdon, by James Clift; and when out there last autumn I was told of it, and saw the decaying fronds. It was scattered rather sparingly, but I should suspect it to be growing in other similar situations in that neighbourhood. Equisetum sylvaticum and palustre were growing sparingly near the same spot; and in a meadow close by, a new habi-

tat for Parnassia palustris was pointed out, where it had been in tolerable abundance last season. — *David Cameron; Botanic Garden, Birmingham, March* 5, 1843.

276. *Reply to Mr. Watson's Enquiry respecting Mr. S. Gibson.* As your correspondent Mr. Watson appears to have some doubts as to the identity of the S. Gibson mentioned by Mr. Francis in his 'Analysis of British Ferns,' in connection with Polypodium calcareum, and again in Mr. Watson's 'New Botanist's Guide, — (Phytol. 524); perhaps you will allow me to make a few remarks, which will, I think, set the question at rest. In 1830—33 I sent several parcels of dried plants to Mr. R. B. Bowman; in these parcels there was every plant mentioned in Watson's Guide, with the name of Gibson connected with them, with the exception of Geranium nodosum, and that I never sent to any correspondent, since I never had more than one specimen of the plant, and that specimen is still in my possession. If the Geranium in question be any Geranium which I sent to Mr. Bowman, it will be Geranium pyrenaicum, and the locality would be Washerlane, near Halifax: and the labels for Polypodium calcareum would be written *Sheden Clough, near Burnley, Lancashire.* If Mr. Bowman sent Mr. Watson *fragmentary* and *ill-dried* specimens, I cannot help that; but I must say that I think Mr. B. might have sent a few good ones out of the two or three hundred specimens of P. calcareum which I sent him. The locality for Meum Athamanticum should have been Ripponden, not Ripon, as in the 'Botanist's Guide,' p. 284. If Mr. Watson or any of his friends should happen to be in this neighbourhood, and should wish to see the plants growing, I shall be happy to go with them to *all* or any of the localities given on my authority, the Geranium nodosum and Asarum europæum excepted. In 1830 I could have gathered five hundred specimens of Asarum, and have left perhaps twice that number; in 1842 I visited the locality in company with Mr. Borrer, and we sought for some time before we could find a single specimen, but at length we found a few, perhaps six or seven, some of which we gathered, and the rest we left. If it do appear this season, I expect it will be the last; and then the Yorkshire Flora will lose Asarum europæum, since we have no other authentic locality for it in the county. — *Samuel Gibson; Hebden Bridge, March* 15, 1843.

277. *Note on Polypodium Dryopteris.* I am informed by my relative, the Rev. T. Gisborne, that this fern was *not* introduced at Yoxall Lodge, as suggested in a former No. (Phytol. 509). It exists in extremely small quantity, and the spot has not been altered since the enclosure of Needwood Forest.—*C. C. Babington; Cambridge, March* 1843.

ART. CXXXV.—*Proceedings of Societies.*

LINNEAN SOCIETY.*

June 7, 1842.—The Lord Bishop of Norwich, President, in the chair.

The Hon. H. Wright, of the Ceylon Civil Service, presented specimens of the fine Ceylon cinnamon of commerce, of the unusual length of eleven feet.

Read, the commencement of a paper by Mr. Clark, "On the Sea Cocoa-nut of the Seychelles, (*Lodoicea Sechellarum*, Comm. and Labill.)

June 21.—Edward Forster, Esq., V.P., in the chair.

Read, "Observations on the Growth and Reproduction of Enteromorpha intestinalis." By A. H. Hassall, Esq. The author states that in their earliest stage of development the tapering filaments of this plant consist of a single series of cells placed end to end. Each cell is afterwards bisected by a longitudinal line; other lines subsequently make their appearance, and each original cell is thus ultimately divided into several others, each of which in its turn enlarges and is divided in the same manner. From the repetition of this process the filaments increase in size, lose their confervoid character, present a reticulated appearance and become cylindrical and hollow. The author states that in each articulation of the filaments, even when no thicker than a horse-hair, a dark central nucleus is developed, and that this is the reproductive germ, which he doubts not undergoes repeated division in the same manner as the reproductive globules of the Ulvæ. These nuclei germinate while enclosed within the cells, the filament still retaining its freshness and vigour; and from them arise the jointed tapering filaments first described, which, after the rupture of the parent cell, and while their bases are still fixed within it, strongly resemble a parasitic Conferva. This development, division and growth of cells and reproductive bodies appears to be constantly going on, whence most specimens of the plant present examples of each stage of formation. From these observations Mr. Hassall is led to regard Enteromorpha intestinalis as bearing a relation to the Confervæ in its young articulated filaments, and to the Ulvæ in its reproductive globules. The author objects to the tautology of the specific name, and proposes that of lacustris in its place.

Read also the conclusion of Mr. Clark's paper "On the Sea Cocoa-nut of the Seychelles." For a report of a paper on this subject, subsequently read before the Botanical Society of London, see Phytol. 463; the following are additional particulars. The part of the trunk immediately above the ground forms an inverted cone, the apex of which is of an hemispherical form, with a great number of cord-like roots spreading from it in all directions, and remaining long after the destruction of the plant to which they belonged. Where the trees have disappeared from clearings, by burning or otherwise, a black circle on the surface indicates their former site. This circle is the base of the cone before mentioned, which now forms a huge bowl, often filled with decayed vegetable matter. On removing this, the interior of the bowl is found to be pierced by a number of holes, each large enough to admit the end of the fore finger. These holes are the openings of the compact, sonorous and brittle tubes into which the roots have been converted by the decay of their internal substance. Mr. Clark states that the leaves are so firmly attached to the trunk, that a man may seat himself at the end of one with perfect safety. The fibres of the leaflets are very strong and arranged in three layers, the central one being disposed transversely, the others longitudinally; in consequence of this arrangement, their tissue, when divested of the parenchyma, resembles coarse book muslin. Both male and female spadix are stated to pass through a fissure in the base of the accompanying leaf-stalk. The drupe is fifteen inches in length, about three feet in circumference, and weighs from thirty to forty pounds; as many as seven well-formed drupes are sometimes seen on a single spadix. The fecundation is occasionally imperfect, and then the ovary expands and lengthens, but does not assume the usual form, and at the end of two or three years it falls off. A female plant at Mahé flowered for several years without producing fruit, owing to the absence of a male plant. In 1833, a male flower was procured from an estate a few miles distant, and suspended in the tree; about two months afterwards one of the buds expanded, and the mature fruit fell from the tree at the end of 1841.

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* From various causes we are sadly behind with our reports of the Linnean Society; we hope to bring up arrears in the present and next number.—*Ed.*

November 1.—R. Brown, Esq., V.P., in the chair.

Jonathan Pereira, M.D., F.L.S., presented specimens of the different varieties of Ceylon, Malabar and Java cardamoms, &c.

Read, "A Notice of the African Grain called Fundi or Fundungi." By Robert Clarke, Esq., Senior Assistant-Surgeon to the Colony of Sierra Leone. This grain is about the size of mignonette-seed, and is said to be cultivated in the village of Kissy and the neighbourhood of Waterloo, by individuals of the Soosoo, Foulah, Bassa and Joloff nations, by whom it is called "hungry rice." Mr. Clarke describes the mode of cultivation, and the various methods of preparing the grain for food; and he is of opinion that if imported into Europe, it might prove a valuable addition to the list of light farinaceous articles of food in use among the delicate or convalescent.

Specimens of the grass which accompanied Mr. Clarke's communication had been examined by Mr. Kippist, Libr. L.S., who added some observations on its botanical characters. It is slender, with digitate spikes, and has much of the habit of Digitaria, but on account of the absence of the small outer glume existing in that genus, it must be referred to Paspalum. Mr. Kippist regards it as an undescribed species, although specimens, collected by Afzelius at Sierra Leone, are in the herbaria of Sir J. E. Smith and Sir Joseph Banks. Mr. Kippist names it P. exile, and gives the characters.

Read also a letter from N. B. Ward, Esq. F.L.S., relative to the introduction of the Musa Cavendishii into the Navigators' Islands, (Phytol. 527).

November 15.—E. Forster, Esq., V.P., in the chair.

Mr. T. S. Ralph, A.L.S., presented numerous fruits and seeds collected in the neighbourhood of Aurungabad.

Read, a note "On the permanent varieties of Papaver orientale, *L.*" By T. Forster, M.B., F.L.S., &c. The author states that ever since the introduction of Papaver bracteatum, *Lindl.* into England, he has regarded it as a permanent variety of P. orientale. This name he retains for the species, both as being the older one, and applicable to all the varieties; of which the four following he considers as permanent:—

1. *P. orientale bracteatum;* seeds always perfect. 2. *P. orientale præcox*, the "Monkey Poppy'' of the old gardeners; flowering in May with the preceding, seeds always sterile. 3. *P. orientale serotinum;* flowering in June, seeds always imperfect. 4. *P. orientale, capsulâ et floribus longioribus;* flowers in May, seeds sometimes perfect. Only met with in continental gardens. Dr. Forster states that he has been assured in the South of Europe, that P. orientale bracteatum yields the best opium, and that in the largest quantity; and as this plant seeds freely and suits the English soil, he thinks it might be advantageously substituted for P. somniferum.

Read also, a note "On Secale cornutum, the Ergot of Rye:" and "On a Species of Asplenium related to A. Trichomanes, *L.*" By A. Haro, M.D., of Metz. In the latter communication Dr. Haro calls attention to a fern discovered by himself in the well of an old castle. The well is large, four-cornered, and with a square window at the top in one of the sides. The wall opposite to the window is covered with the fern, which lies flat upon the stones, to which the fronds are attached throughout their whole length by slender roots, and adhere so firmly that it is difficult to remove them, even with a knife. A professor, to whom Dr. Haro submitted the plant, regarded it as a new species, and has named it *A. Harovii:* he has also furnished descriptive characters of the new plant, as well as of the three allied species, A. Trichomanes, viride and Petrarchæ. We give the characters of A. Harovii, which is placed between A. Trichomanes and viride.

A. Harovii. Frond *decumbent*, fixed to stones by very slender fibrils, *glabrous*, unequally pinnate; stipes blackish-varnished, furnished above with an indistinct membrane, running down on each side from the insertion of the pinnules, (*appendiculatus*); middle pinnules *hastato-rhomboid*, *three-lobed*, upper pinnules oblong, obliquely attenuated or wedge-shaped at the base, unequally pinnatifid, all obtuse but *acutely toothed.*

December 6.—E. Forster, Esq., V.P., in the chair.

Read, a portion of "An Essay on the Distribution, Vitality, Structure, Modes of Growth and Reproduction, and Uses, of the Fresh-water Confervæ." By Arthur Hill Hassall, Esq.

December 20.—E. Forster, Esq., V.P., in the chair.

A. H. Hassall, Esq. exhibited an apple in which decay had been artificially induced by inoculating it with decayed matter from another apple containing filaments of Entophytal Fungi.

Read, a continuation of Mr. Hassall's memoir on the fresh-water Confervæ.

Read also, "Some further Observations on the Nature of the Ergot of Grasses." By Edwin John Quekett, Esq., F.L.S.

BOTANICAL SOCIETY OF LONDON.

February 17, 1843.—J. E. Gray, Esq., F.R.S. &c., President, in the chair. The following donations were announced. British plants from Dr. Streeten, and foreign plants from Mr. Samuel Simpson. Donations to the library were announced from Mr. H. C. Watson and Mr. E. Newman. Mr. T. Clarke, jun. presented specimens of a very large variety of Lastræa Filix-mas, found by him at King's Cliff Valley, near Bridgewater.

Mr. G. H. K. Thwaites read a paper, being a Notice of the discovery of Grimmia orbicularis, a moss new to Britain, which was found by him upon St. Vincent's Rocks, Bristol. The foliage is not distinguishable from that of Grimmia pulvinata; the capsule however is abundantly distinct, being globose instead of ovate, and having a conical instead of a rostrate operculum. Both species grow upon St. Vincent's Rocks, and are sometimes intermingled, but each retains its peculiar characteristics, so that Grimmia orbicularis cannot be considered a variety of G. pulvinata. Specimens of the former species accompanied the paper.

Read also, a paper from Mr. T. Beesley, being "Additions to the List of Plants found in the neighbourhood of Banbury, Oxfordshire, in 1842."

March 17.—J. E. Gray, Esq., F.R.S., &c., President, in the chair. Mr. David Moore, of the Royal Botanic Garden, Dublin, presented a specimen of Carex paradoxa

(*Willd.*) found by him in Ladiston Woods, Mullingar, Westmeath, Ireland, in July last. Mr. Robert Castle presented a specimen of Araucaria excelsa. Col. Jackson presented an interesting collection of foreign plants. The President presented the 1st fasciculus of Leefe's British Willows: and British plants had been received from Mr. T. B. Hall, Dr. Ayres, Mr. Henfrey and Miss Beever. Donations to the library were announced from Professor Meneghini, Mr. W. M. Chatterley and the American Philosophical Society.

Mr. Arthur Henfrey read a paper "On the British Species of Statice."* Specimens of British and foreign species in the Society's collection were exhibited.—*G.E.D.*

MICROSCOPICAL SOCIETY OF LONDON.

March 15, 1843.—George Loddiges, Esq. in the chair.

Read, a paper from the Rev. J. B. Reade, entitled "Microscopic Chemistry, No. II." The paper was headed "On the existence of Ammonia in Vegetable Substances described as containing Nitrogen." After stating that very minute portions of sulphate of lime in snow may be rendered manifest by means of the microscope, and also that the almost inappreciable quantitiy of ammonia mentioned by Liebig as existing in the atmosphere would be capable of detection by the same means; the author proceeded to show the existence of ammonia in the seeds of plants, which he stated may be rendered apparent by burning the common field bean in a spirit-lamp, until flame and smoke entirely cease. The gas given off is to be received on slips of glass moistened with pure hydrochloric acid. The salt thus obtained he describes as a salt of ammonia, which he considers to be produced by the decomposition of an ammoniacal salt previously existing in the bean, and not by the destructive distillation of an organic body in contact with the atmosphere. This presence of ammoni[illegible]thor looks upon as proved in various ways: — 1. By the before-mentioned production of crystals of hydrochlorate of ammonia on slips of glass, when the gas from the bean is exposed to the vapour of volatile hydrochloric acid. 2. By the odour of this gas when received into an eight or ten ounce bottle, being clearly that of ammonia. 3. By the production of crystals of bi-tartrate of ammonia on the addition of a little tartaric acid to the hydrochlorate. 4. By the action of the supposed ammoniacal gas on test-papers, furnishing a proof of the presence of volatile alkali. And lastly, by an experiment in which he sublimed over hydrochlorate of ammonia, in an unchanged state, into a drop of distilled water. The acid with which the ammonia is combined he supposes in some instances at least to be silicic acid. In answer to an objection made to these views, that the ammonia is chemically formed by the destructive distillation of the vegetable compound in contact with the atmosphere, the author adduced what, in his opinion, must be considered both negative and positive evidence: the former being founded on the known reluctance of nitrogen to enter into combination with all other substances; the latter principally from the evolution of ammonia from bean-meal, heated in a glass tube with the mouth inserted into hydrochloric acid, thus preventing contact with the atmosphere. The author concluded by describing a method of readily obtaining as a standard of measurement, a minute quantity of hydrochlorate of ammonia, equal to about the $\frac{1}{10000}$ of a grain.

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* This paper will most probably appear in our next number.—*Ed.*